IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Appellants:	D. Foote et al.	Attorney Docket No. THAS121883
Application No:	10/692,326	Group Art Unit: 3673 / Confirmation No.: 8551
Filed:	October 22, 2003	Examiner: V.A. Patel
Title:	SEAL ASSEMBLY FOR RECIPROCATING SHAFT	

APPELLANTS' APPEAL BRIEF

Seattle, Washington
August 6, 2007

TO THE COMMISSIONER FOR PATENTS:

This Appeal Brief is filed in support of the Notice of Appeal filed June 6, 2007, appealing the Examiner's final rejection dated March 7, 2007, of pending Claims 1, 3 and 4. Claims 1 and 4 were rejected under 35 U.S.C. § 102(b) as being anticipated by Peil et al. (U.S. Patent No. 4,877,217). Claim 1 was also rejected under 35 U.S.C. § 102(b) as being anticipated by Rasmussen (U.S. Patent No. 1,709,949). Claim 3 was rejected under 35 U.S.C. § 103 as being unpatentable over Peil in view of Thompson (U.S. Patent No. 3,987,846).

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TABLE OF CONTENTS

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I. REAL PARTY IN INTEREST

The subject application is owned by the inventors Dean Foote, Scott Delbridge, and the estate of Clayton Delbridge, who are the real parties in interest.

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II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

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III. STATUS OF CLAIMS

Claims 1, 3, and 4 have been finally rejected, and it is these rejections that are being appealed.

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IV. STATUS OF AMENDMENTS

No amendments to the application have been filed subsequent to the final rejection of March 7, 2007.

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V. SUMMARY OF CLAIMED SUBJECT MATTER

Claim 1 is directed to a seal assembly 10. An embodiment of the seal assembly is described in the specification at page 3, line 32 to page 4, line 23, and is depicted in FIGS. 1 and 2.

Referring to FIGS. 1 and 2, seal assembly for a reciprocating shaft 10, such as a ram shaft of a blow out preventer, includes a body 12 having a bore 14 (page 3, lines 32 – 34). There is a shaft 20 that has a first end and a second end that is adapted to move reciprocally within body 12 between an extended position extending from body 12 as shown in FIG. 1 and a retracted position retracted within body 12 as shown within FIG. 2 (page 3, line 34 – page 4, line 1 and page 4, lines 26 – 33). Seal assembly 10 also includes at least one first circumferential seal 22 positioned in body 12 and circumscribing the first end of shaft 20 (page 4, lines 1 – 7). First circumferential seal 22 performs a dedicated sealing function of preventing fluids from migrating along shaft 20 from a first region of body 12 (page 4, lines 1 – 7). The shaft has a first seal travel area 30 which is in contact with first seal 22 during axial reciprocating movement of shaft 20 (page 4, lines 7 – 9). At least a portion of first seal travel area 30 extends from body 12 where it is exposed to contaminants when shaft 14 is in the extended position (page 4, lines 27 – 29).

Seal assembly 10 also includes at least one second circumferential seal 32 positioned in body 12 and circumscribing the first end of shaft 20 in axially spaced relation to first circumferential seal 22 (page 4, lines 9 – 17). Second circumferential seal 32 is dedicated to performing the same sealing function as first circumferential seal 22 and serves as a redundant back up seal until first circumferential seal 22 experiences seal failure (page 5, lines 2 – 11). Second circumferential seal 32 is positioned to prevent fluids from migrating along shaft 20 from the first region of body 12 and to maintain the seal at the first end of shaft 14 in the event of a failure of first circumferential seal 22 (page 5, lines 2 – 11). First and second seals 22 and 32

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may comprise a seal cluster including a primary seal 24 and 34, a seal ring carrier 26 and 35, a wiper seal 27 and 36 and an o-ring seal 28 and 38, respectively. Shaft 14 has a second seal travel area 40 which is in contact with second seal 32 during axial reciprocating movement of shaft 14 (page 4, lines 17 – 20). Second seal area 40 remains sheltered within body 12 even when shaft 14 is in the extended position (page 4, lines 29 – 31).

First seal travel area 30 and second seal travel area 40 are axially spaced separate and distinct areas on shaft 14, such that damage to the exposed portion of first seal travel area 30 leading to a failure of first circumferential seal 22 does not lead to failure of second circumferential seal 32, as second circumferential seal 32 engages second seal travel area 40 which is separate and distinct from first seal travel area 30 (page 4, line 26 – page 5, line 11).

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VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1 and 4 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,877,217 (Peil). Claim 1 was rejected under 35 U.S.C. § 102(b) as being anticipated by US Patent No. 1,709,949 (Rasmussen). Claim 3 was rejected under 35 U.S.C. § 103 as being unpatentable over Peil, in view of U.S. Patent No. 3,987,846 (Thompson). In view of these rejections, the issues presented for review on appeal are as follows:

Issue 1: Whether Peil teaches the seal assembly claimed in Claim 1

Issue 2: Whether Rasmussen teaches the seal assembly claimed in Claim 1

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VII. ARGUMENT

In order to be anticipated, "every element of the claim must be shown in the reference, including all limitations." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920-21 (Fed. Cir. 1989). "[T]he reference must describe the claimed invention sufficiently to place it in the possession of a person of ordinary skill in the field." See *In re Paulsen*, 30 F.3d 1475 (Fed. Cir. 1997). It is appellants' position that neither Peil nor Rasmussen, as cited by the Examiner, anticipate Claim 1 of the present application. Because Claims 3 and 4 depend upon Claim 1, Claim 3 is not anticipated by Peil, and Claim 4 is patentable over Peil, in view of Thompson.

Peil Does Not Teach the Seal Assembly Claimed by Claim 1

Claim 1 recites "a least one circumferential seal positioned in the body" and "at least one second circumferential seal positioned in the body... the second circumferential seal being dedicated to performing the same sealing function as the first circumferential seal and serving as a redundant back up seal until the first circumferential seal experiences seal failure". It is the Examiner's position that seals 30 and 32 as taught by Peil are the same as these seals. The Applicants respectfully disagree. At Col. 2, lines 33-42, Peil states:

> A first seal 30 and a second seal 32, preferably O-rings, are positioned between the ram shaft 26 and the bore 22 to prevent flow or leaks of the well fluid from the ram bore 14 or of hydraulic fluid from the chamber 24. A leak indicator port 34, which communicates with an annular chamber 35 in the bore 22 between the first seal 30 and the second seal 32 provides for fluid leakage externally of the body 20 which can be visually observed if either of the seals 30 and 32 becomes defective. (Emphasis added).

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Thus, it is clear that seals 30 and 32 do not act as a backup for one another. The seals 30 and 32 are positioned on either side of the leak indicator port 34, such that the failure of either seal results in leakage through the port 34, rather than the seal that has not failed acting as a backup. Nowhere does Peil suggest that this is the case. Furthermore, seals 30 and 32 perform different sealing functions. Seal 30 acts against fluid pressure from longitudinal bore 12 in ram bore 14, while seal 32 acts against the hydraulic fluid introduced through a port 94. Neither seal can be considered redundant, as each is performing an active sealing function. Failure of either seal is indicated by fluid flowing from a leak indicator port 34, which indicates that operation must be stopped. As claimed in Claim 1, the second circumferential seal is a redundant seal and is dedicated to perform the same sealing function as the first circumferential seal. This feature allows operation of the device that incorporates the seal assembly to continue.

Claim 1 also recites "at least a portion of the first seal travel area extending from the body where it is exposed to contaminants when the shaft is in the extended position". The Examiner found this limitation to refer to the seal assembly's intended use, and accorded it little patentable weight. While exposing the first seal travel area to contaminants may refer to an intended use, the applicants disagree that extending at least a portion of the first travel area from the body as claimed refers to an intended use. The shaft is defined as being adapted to move between an extended position and a retracted position. Clearly, the ability to extend at least a portion of the first travel area from the body is part of the structure, and not an intended use. Peil does not teach this limitation. The first travel area referred to by the Examiner is always sheltered within the ram bore 14 of the blow out preventer body 10, and does not extend from the body.

The Examiner also gave little patentable weight to other design limitations that make the claimed seal assembly advantageous over the prior art, such as: "a reciprocating shaft", "the second circumferential seal ... serving as a redundant back up seal until the first circumferential

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seal experiences seal failure" and "the second circumferential seal being positioned ... to maintain the seal at the first end of the shaft in the event of a failure of the first circumferential seal". Applicants respectfully disagree with this position. As claimed, the seal assembly has two seals that seal against well fluids. Each seal travels along a separate portion of the reciprocating shaft, such that wear caused by debris that has accumulated on the first portion of the shaft only damages the first circumferential seal. This configuration allows drilling operations to continue in the event of a failure of the first circumferential seal, as the second circumferential seal will perform the required sealing function when the first seal fails. This enables a well drilling operation to be safely completed prior to well shut down. Peil is incapable of this. Peil has two seals: one for sealing against any fluid pressure in bore 12, and one for sealing against hydraulic fluid that activates the ram. The failure of either results in leaking fluid through a port 34 and requires immediate attention. Applicants submit that these statements are design limitations, as they breathe life and meaning to Claim 1.

Thus, Peil does not teach Claim 1 because the two seals taught by Peil perform different sealing functions, one seal does not serve as a redundant back up seal for the other, neither travel area associated with the seals extends from the body, and the seal assembly does not allow the device to continue operation in the event of a seal failure.

Rasmussen Does Not Teach the Seal Assembly Claimed by Claim 1

Rasmussen teaches a blowout preventer for a drill string. The blowout preventer is intended to "retain the gas in a well during the insertion of a drill stem or a string of casing into or drawing these from a well" (page 1, lines 16-20). The Examiner's position is that this casing string is equivalent to the reciprocating shaft claimed by applicants. However, the casing described by Rasmussen is either inserted or drawn out, and does not reciprocate. Therefore, the

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casing cannot have "a first seal travel area which is in contact with the first seal during axial reciprocating movement of the shaft" and "a second seal travel area which is in contact with the second seal during axial reciprocating movement of the shaft... the first seal travel area and the second seal travel area being axially spaced separate and distinct areas on the shaft" as recited in Claim 1. While the string may be miles long, the packers referred to by the Examiner (85 and either 55 or 118) appear to be at most a few feet apart. Clearly, the packers cannot have travel areas on the casing that are separate and distinct. Having separate and distinct areas prevents any buildup or debris that wears or damages the first circumferential seal to also wear or damage the second circumferential seal. The arrangement described by Rasmussen is unable to provide this advantage.

Applicants also note that the packers 85, 55 and 118 the Examiner refers to are not seals as the term is used in Claim 1. While Claim 1 refers to the first and second circumferential seals "performing a dedicated sealing function", the packers are not always in sealing engagement with the casing. On page 4, lines 76 to 115, Rasmussen states that "the blow-out preventer 20 is used only when there is gas present in the well" and goes on to describe how the packers are forced into sealing engagement with the casing when gas is present. On page 4, line 75 to page 5, line 69 Rasmussen describes how the packers are retracted from the casing to allow a coupling 261 to pass through.

Thus, Rasmussen does not teach Claim 1 because the string does not reciprocate, the string does not have separate and distinct travel areas for each seal, and the packers taught by Rasmussen do not performing a dedicated sealing function.

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VIII. CONCLUSION

In light of the above arguments, appellants submit that Peil and Rasmussen fail to teach or suggest each and every element of Claim 1. Accordingly, appellants submit that the Office Action has failed to present a *prima facie* case of anticipation that supports a rejection of Claim 1. The Board should direct that the 35 U.S.C. § 102(b) rejection of Claim 1 be withdrawn and the Claim allowed. As Claims 3 and 4 depend upon Claim 1, these claims should also be allowed.

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IX. CLAIM APPENDIX

1. A seal assembly for a reciprocating shaft, comprising:

a body having a bore;

a shaft having a first end and a second end, the shaft being adapted to move reciprocally within the body between an extended position extending from the body and a retracted position retracted within the body;

at least one first circumferential seal positioned in the body and circumscribing the first end of the shaft, the first circumferential seal performing a dedicated sealing function of preventing fluids from migrating along the shaft from a first region of the body, the shaft having a first seal travel area which is in contact with the first seal during axial reciprocating movement of the shaft, at least a portion of the first seal travel area extending from the body where it is exposed to contaminants when the shaft is in the extended position;

at least one second circumferential seal positioned in the body and circumscribing the first end of the shaft in axially spaced relation to the first circumferential seal, the second circumferential seal being dedicated to performing the same sealing function as the first circumferential seal and serving as a redundant back up seal until the first circumferential seal experiences seal failure, the second circumferential seal being positioned to prevent fluids from migrating along the shaft from the first region of the body and to maintain the seal at the first end of the shaft in the event of a failure of the first circumferential seal, the shaft

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having a second seal travel area which is in contact with the second seal during axial reciprocating movement of the shaft, the second seal area remaining sheltered within the body even when the shaft is in the extended position; and

the first seal travel area and the second seal travel area being axially spaced separate and distinct areas on the shaft, such that damage to the exposed portion of the first seal travel area leading to a failure of the at least one first circumferential seal does not lead to failure of the at least one second circumferential seal, as the second circumferential seal engages the second seal travel area which is separate and distinct from the first seal travel area.

2. (Previously canceled)

3. The seal assembly of Claim 1, wherein the first and second seals each comprise a seal cluster including a primary seal, a seal ring carrier, a wiper seal and an o-ring seal.

4. The seal assembly of Claim 1, wherein the shaft is a ram shaft of a blow out preventer.

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X. EVIDENCE APPENDIX

None.

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XI. RELATED PROCEEDINGS APPENDIX

None.

Respectfully submitted,

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